



CHAPTER 3

Setting Up the Cisco Unified IP Phone

This chapter includes the following topics, which help you install the Cisco Unified IP Phone 7965G and 7945G on an IP telephony network:

- [Before You Begin, page 3-1](#)
- [Understanding the Cisco Unified IP Phone 7965G and 7945G Components, page 3-2](#)
- [Installing the Cisco Unified IP Phone, page 3-5](#)
- [Attaching a Cisco Unified IP Phone Expansion Module, page 3-8](#)
- [Adjusting the Placement of the Cisco Unified IP Phone, page 3-9](#)
- [Verifying the Phone Startup Process, page 3-12](#)
- [Configuring Startup Network Settings, page 3-13](#)
- [Configuring Security on the Cisco Unified IP Phone, page 3-13](#)



Note

Before you install a Cisco Unified IP phone, you must decide how to configure the phone in your network. Then you can install the phone and verify its functionality. For more information, see [Chapter 2, “Preparing to Install the Cisco Unified IP Phone on Your Network.”](#)

Before You Begin

Before installing the Cisco Unified IP Phone, review the requirements in these sections:

- [Network Requirements, page 3-1](#)
- [Cisco Unified Communications Manager Configuration, page 3-2](#)

Network Requirements

For the Cisco Unified IP Phone 7965G and 7945G to successfully operate as a Cisco Unified IP Phone endpoint in your network, your network must meet these requirements:

- Working Voice over IP (VoIP) network:
 - VoIP configured on your Cisco routers and gateways
 - Cisco Unified Communications Manager Release 7.0 or higher installed in your network and configured to handle call processing

- IP network that supports DHCP or manual assignment of IP address, gateway, and subnet mask

**Note**

The Cisco Unified IP Phone displays the date and time from Cisco Unified Communications Manager. If the Cisco Unified Communications Manager server is located in a different time zone than the phones, the phones will not display the correct local time.

Cisco Unified Communications Manager Configuration

The Cisco Unified IP Phone requires Cisco Unified Communications Manager to handle call processing. Refer to *Cisco Unified Communications Manager Administration Guide* or to context-sensitive help in the Cisco Unified Communications Manager application to ensure that Cisco Unified Communications Manager is set up properly to manage the phone and to properly route and process calls.

If you plan to use auto-registration, verify that it is enabled and properly configured in Cisco Unified Communications Manager before connecting any Cisco Unified IP Phone to the network. For information about enabling and configuring auto-registration, refer to *Cisco Unified Communications Manager Administration Guide*. Also, see the [“Adding Phones to the Cisco Unified Communications Manager Database”](#) section on page 2-8.

You must use Cisco Unified Communications Manager to configure and assign telephony features to the Cisco Unified IP Phones. See the [“Telephony Features Available for the Phone”](#) section on page 5-2 for details.

In Cisco Unified Communications Manager, you can add users to the database and associate them with specific phones. In this way, users gain access to web pages that allow them to configure items such as call forwarding, speed dialing, and voice messaging system options. See the [“Adding Users to Cisco Unified Communications Manager”](#) section on page 5-17 for details.

Understanding the Cisco Unified IP Phone 7965G and 7945G Components

The Cisco Unified IP Phone 7965G and 7945G include these components on the phone or as accessories for the phone:

- [Network and Access Ports](#), page 3-2
- [Handset](#), page 3-3
- [Speakerphone](#), page 3-3
- [Headset](#), page 3-3

Network and Access Ports

The back of the Cisco Unified IP Phone includes these ports:

- Network port—Labeled 10/100/1000 SW on the Cisco Unified IP Phone 7965G and 7945G
- Access port—Labeled 10/100/1000 PC on the Cisco Unified IP Phone 7965G and 7945G

You can use either Category 3/5/5e/6 cabling for 10 Mbps connections, but you must use Category 5/5e/6 for 100 Mbps connections and Category 5e/6 for 1000 Mbps connections.

Use the SW network port to connect the phone to the network. You must use a straight-through cable on this port. The phone can also obtain inline power from a switch over this connection. See the [“Providing Power to the Phone” section on page 2-3](#) for details.

Use the PC access port to connect a network device, such as a computer, to the phone. You must use a straight-through cable on this port.

Handset

The wideband-capable handset is designed especially for use with a Cisco Unified IP Phone. It includes a light strip that indicates incoming calls and voice messages waiting.

To connect a handset to the Cisco Unified IP Phone, plug the cable into the handset and into the Handset port on the back of the phone.

Speakerphone

By default, the wideband-capable speakerphone is enabled on the Cisco Unified IP Phone.

You can disable the speakerphone by using Cisco Unified Communications Manager Administration. To do so, choose **Device > Phone** and locate the phone you want to modify. In the Phone Configuration window for the phone, check the **Disable Speakerphone** check box.

Headset

Although Cisco Systems performs limited internal testing of third-party headsets for use with the Cisco Unified IP Phones, Cisco does not certify or support products from headset (or handset) vendors.

Cisco recommends the use of good quality external devices, for example, headsets that are screened against unwanted radio frequency (RF) and audio frequency (AF) signals. Depending on the quality of headsets and their proximity to other devices, such as mobile phones and two-way radios, some audio noise or echo may still occur. An audible hum or buzz may be heard by either the remote party or by both the remote party and the Cisco Unified IP Phone user. Humming or buzzing sounds can be caused by a range of outside sources; for example, electric lights, electric motors, or large PC monitors. See [Using External Devices, page 3-5](#).



Note

In some cases, hum may be reduced or eliminated by using a local power cube or power injector.

These environmental and hardware inconsistencies in the locations where Cisco Unified IP Phones are deployed means that there is not a single headset solution that is optimal for all environments.

Cisco recommends that customers test headsets in their intended environment to determine performance before making a purchasing decision and deploying en masse.



Note

Cisco Unified IP Phone 7965G and 7945G support wideband headsets.

Audio Quality Subjective to the User

Beyond the physical, mechanical and technical performance, the audio portion of a headset must sound good to the user and the party on the far end. Sound quality is subjective and Cisco cannot guarantee the performance of any headsets. However, a variety of headsets from leading headset manufacturers have been reported to perform well with Cisco Unified IP Phones. See manufacturer's sites for details.

For information about wireless headsets that work in conjunction with the wireless headset remote hookswitch control feature, go to the following URL: <http://www.cisco.com/cgi-bin/ctdp/Search.pl>

1. Choose **IP Communications** from the Enter Solution drop-down list box. The Select a Solution Category drop-down list box displays.
2. Choose **IP Phone Headsets** to see a list of Technology Development Program partners.

If you want to search for a particular Technology Development Program partner, enter the partner's name in the Enter Company Name box.

Connecting a Headset

To connect a wired headset to the Cisco Unified IP Phone, plug it into the Headset port on the back of the phone. Press the **Headset** button on the phone to place and answer calls using the headset.

You can use the wired headset with all of the features on the Cisco Unified IP Phone, including the Volume and Mute buttons. Use these buttons to adjust the ear piece volume and to mute the speech path from the headset microphone.

The wireless headset remote hookswitch control feature allows you to use a wireless headset with the Cisco Unified IP Phone. Refer to the wireless headset documentation for information about connecting the headset and using the features.

Disabling a Headset

You can disable the headset through the Cisco Unified Communications Manager Administration. If you do so, you also will disable the speakerphone.

To disable the headset from Cisco Unified Communications Manager Administration, choose **Device > Phone** and locate the phone that you want to modify. In the Phone Configuration window for the phone, check the **Disable Speakerphone and Headset** check box.

Enabling a Wireless Headset

By default, the wireless headset remote hookswitch control feature is disabled. You can enable it through the Cisco Unified Communications Manager Administration application. To do so, choose **Device > Phone** and locate the phone you want to modify. In the Phone Configuration window for the phone, select **Enable** for the Headset Hookswitch Control option.

On the phone, you can verify that the feature is enabled by choosing **Settings > Device Configuration > Media Configuration**, and verifying that the Headset Hookswitch Control setting displays **Enabled**.

Using External Devices

The following information applies when you use external devices with the Cisco Unified IP Phone:

Cisco recommends the use of good quality external devices that are shielded (screened) against unwanted radio frequency (RF) and audio frequency (AF) signals.

Depending on the quality of these devices and their proximity to other devices such as mobile phones or two-way radios, some audio noise may still occur. In these cases, Cisco recommends that you take one or more of the following actions:

- Move the external device away from the source of the RF or AF signals.
- Route the external device cables away from the source of the RF or AF signals.
- Use shielded cables for the external device, or use cables with a better shield and connector.
- Shorten the length of the external device cable.
- Apply ferrites or other such devices on the cables for the external device.

Cisco cannot guarantee the performance of the system because Cisco has no control over the quality of external devices, cables, and connectors. The system will perform adequately when suitable devices are attached using good quality cables and connectors.



Caution

In European Union countries, use only external headsets that are fully compliant with the EMC Directive [89/336/EC].

Installing the Cisco Unified IP Phone

You must connect the Cisco Unified IP Phone to the network and to a power source before using it. See [Figure 3-1](#) for a graphical representation of the connections.



Note

Before you install a phone, even if it is new, upgrade the phone to the current firmware image.

Before using external devices, read the [“Using External Devices” section on page 3-5](#) for safety and performance information.

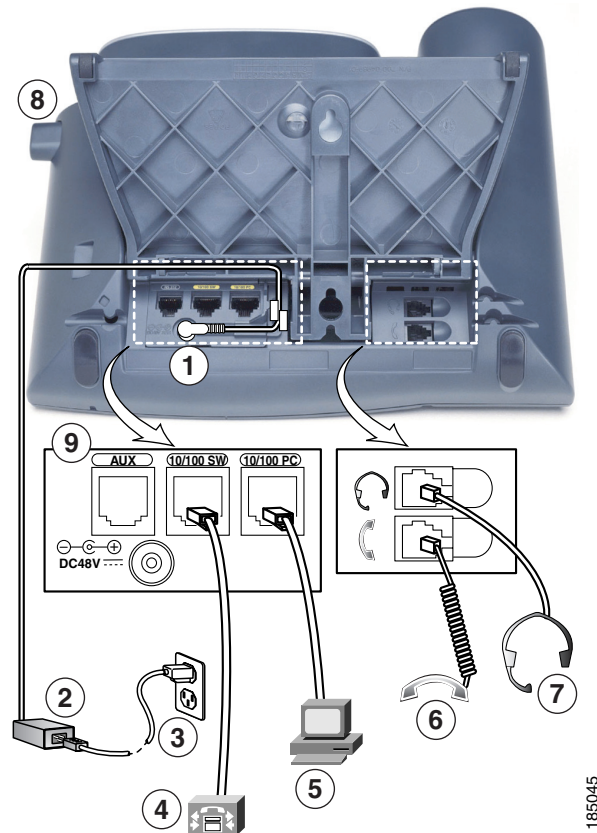
To install a Cisco Unified IP Phone, perform the following steps:

Table 3-1 *Installing the Cisco Unified IP Phone 7965G and 7945G*

Task	Purpose	Related Topics
1.	Connect the handset to the Handset port.	—
2.	Connect a headset to the Headset port. Optional. You can add a headset later if you do not connect one now.	See the “Headset” section on page 3-3 for supported headsets.
3.	Connect a wireless headset. Optional. You can add a wireless headset later if you do not want to connect one now.	Refer to the wireless headset documentation for information.

Table 3-1 *Installing the Cisco Unified IP Phone 7965G and 7945G (continued)*

Task	Purpose	Related Topics
4.	Connect the power supply to the Cisco DC Adapter port. Optional.	See the “Providing Power to the Phone” section on page 2-3.
5.	Connect a straight-through Ethernet cable from the switch to the 10/100/1000 SW port. Each Cisco Unified IP Phone ships with one Ethernet cable in the box. You can use either Category 3/5/5e/6 cabling for 10 Mbps connections, but you must use Category 5/5e/6 for 100 Mbps connections and Category 5e/6 for 1000 Mbps connections.	See the “Network and Access Ports” section on page 3-2 for guidelines.
6.	Connect a straight-through Ethernet cable from another network device, such as a desktop computer, to the 10/100/1000 PC port. Optional. You can connect another network device later if you do not connect one now. You can use either Category 3/5/5e/6 cabling for 10 Mbps connections, but you must use Category 5/5e/6 for 100 Mbps connections and Category 5e/6 for 1000 Mbps connections.	See the “Network and Access Ports” section on page 3-2 for guidelines.

Figure 3-1 Cisco Unified IP Phone 7965G and 7945G Rear Cable Connections

Cisco Unified IP Phone 7965G and 7945G Rear Cable Connections:

1	DC adaptor port (DC48V)	6	Handset port
2	AC-to-DC power supply	7	Headset port
3	AC power cord	8	Footstand button
4	Network port (10/100 SW)	9	Auxiliary port (AUX)
5	Access port (10/100 PC)		

Related Topics

- [Before You Begin, page 3-1](#)
- [Attaching a Cisco Unified IP Phone Expansion Module](#)
- [Adjusting the Placement of the Cisco Unified IP Phone, page 3-9](#)
- [Configuring Startup Network Settings, page 3-13](#)

Attaching a Cisco Unified IP Phone Expansion Module

Cisco Unified IP Phone Expansion Modules can be attached to a Cisco Unified IP Phone 7965G to extend the number of line appearances or speed dial buttons. You can customize the button templates for the Cisco Unified IP Phone Expansion Module to determine the number of line appearances and speed dial buttons. See the [“Modifying Phone Button Templates” section on page 5-15](#) for details.



Note

Cisco Unified IP Phone Expansion Modules are not supported on the Cisco Unified IP Phone 7945G.

You can attach one or more Cisco Unified IP Phone Expansion Modules to the Cisco Unified IP Phone 7965G by using one of the following methods:

- When you initially add the phone to Cisco Unified Communications Manager, by selecting **7914 14-Button Line Expansion Module** for the Cisco Unified IP Phone Expansion Module 7914, **7915 12-Button Line Expansion Module** or **7915 24-Button Line Expansion Module** for the Cisco Unified IP Phone Expansion Module 7915, or **7916 12-Button Line Expansion Module** or **7916 24-Button Line Expansion Module** for the Cisco Unified IP Phone Expansion Module 7916 in the Module 1 or Module 2 fields, and choosing the appropriate expansion module firmware. See [Step 6](#) in the following procedure.
- After the phone is configured in Cisco Unified Communications Manager.

To configure a Cisco Unified IP Phone Expansion Module on the Cisco Unified IP Phone, follow these steps:

Procedure

- Step 1** Log in to Cisco Unified Communications Manager Administration.
Cisco Unified Communications Manager Administration window displays.
- Step 2** From the menu, choose **Device > Phone**.
The Find and List Phone page appears. You can search for one or more phones that you want to configure for the Cisco Unified IP Phone Expansion Module 7914.
- Step 3** Select and enter your search criteria and click **Find**.
The Find and List Phone window displays showing a list of the phones that match your search criteria.
- Step 4** Click the IP Phone that you want to configure for the Cisco Unified IP Phone Expansion Module 7914.
The Phone Configuration window displays.
- Step 5** Scroll to the Expansion Module Information section.
- Step 6** To add support for one expansion module, in the Module 1 field, choose **7914 14-Button Line Expansion Module** for the Cisco Unified IP Phone Expansion Module 7914, **7915 12-Button Line Expansion Module** or **7915 24-Button Line Expansion Module** for the Cisco Unified IP Phone Expansion Module 7915, or **7916 12-Button Line Expansion Module** or **7916 24-Button Line Expansion Module** for the Cisco Unified IP Phone Expansion Module 7916.

To add support for a second expansion module, in the Module 2 field, choose **7914 14-Button Line Expansion Module** for the Cisco Unified IP Phone Expansion Module 7914, **7915 12-Button Line Expansion Module** or **7915 24-Button Line Expansion Module** for the Cisco Unified IP Phone

Expansion Module 7915, or **7916 12-Button Line Expansion Module** or **7916 24-Button Line Expansion Module** for the Cisco Unified IP Phone Expansion Module 7916.

In the Firmware Load Information section, there are two fields that specify the firmware load for Modules 1 and 2. You can leave these fields blank to use the default firmware load.



Note If you are running the SCCP protocol, you can configure a maximum of 42 lines on your phone. For example, if you configure two 24-line Cisco Unified IP Phone Expansion Modules, you will have a total of 56 lines (48 lines from the modules in addition to the 8 lines on the phone). However, only the first 42 lines will be available for use.

In the Firmware Load Information section, there are two fields that specify the firmware load for Modules 1 and 2. You can leave these fields blank to use the default firmware load.

Step 7 Click the **Save** icon.

A message displays asking you to reset the phone for the changes to take effect. Click **OK**.

Step 8 Click **Reset** for the changes to take effect.



Note Refer users to their Cisco Unified Communications Manager User Options web pages, so they can configure speed dial buttons and program buttons to access phone services on the Cisco Unified IP Phone Expansion Module. See the [“How Users Subscribe to Services and Configure Phone Features” section on page A-3](#) for more details.

Related Topics

- [Before You Begin, page 3-1](#)
- [Adjusting the Placement of the Cisco Unified IP Phone, page 3-9](#)
- [Configuring Startup Network Settings, page 3-13](#)

Adjusting the Placement of the Cisco Unified IP Phone

The Cisco Unified IP Phone includes an adjustable footstand. When placing the phone on a desktop surface, you can adjust the tilt height to several different angles in 7.5 degree increments from flat to 60 degrees. You can also mount these phones to the wall by using the footstand or by using the optional locking wall mount kit.

Adjusting Cisco Unified IP Phone Footstand and Phone Height

You can adjust the footstand adjustment plate on the Cisco Unified IP Phone to the height that provides optimum viewing of the phone screen. See [Figure 3-3](#) for more information.

Procedure

Step 1 Push in the footstand adjustment button.

Step 2 Adjust the footstand to the desired height.

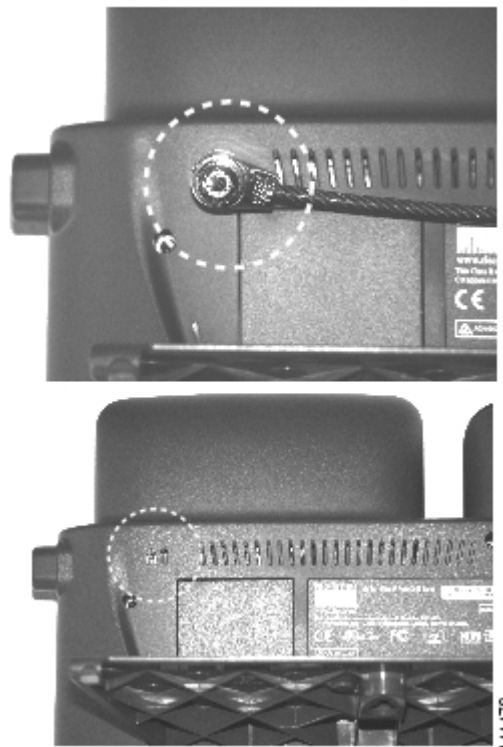
Securing the Phone with a Cable Lock

You can secure the Cisco Unified IP Phone 7965G and 7945G to a desktop by using a laptop cable lock. The lock connects to the security slot on the back of the phone, and the cable can be secured to a desktop.

The security slot can accommodate a lock up to 20 mm. Compatible laptop cable locks include the Kensington laptop cable lock and laptop cable locks from other manufacturers that can fit into the security slot on the back of the phone.

See [Figure 3-2](#).

Figure 3-2 Connecting a Cable Lock to the Cisco Unified IP Phone 7965G and 7945G



Mounting the Phone to the Wall

You can mount the Cisco Unified IP Phone on the wall by using the footstand as a mounting bracket or you can use special brackets available in a Cisco Unified IP Phone wall mount kit. (Wall mount kits must be ordered separately from the phones.) If you attach the phone to a wall by using the standard footstand and not the wall mount kit, you need to supply the following tools and parts:

- Screwdriver
- Screws to secure the Cisco Unified IP phone to the wall

See [Figure 3-3](#) for a graphical representation of the phone parts.

Before You Begin

To ensure that the handset attaches securely to a wall-mounted phone, remove the handset wall hook from the handset rest, rotate the hook 180 degrees, and reinsert the hook. Turning the hook exposes a lip on which the handset catches when the phone is vertical. For an illustrated procedure, refer to *Installing the Wall Mount Kit for the Cisco Unified IP Phone* at:

http://www.cisco.com/en/US/products/hw/phones/ps379/prod_installation_guides_list.html

To mount the phone on the wall using the standard footstand, follow these steps:



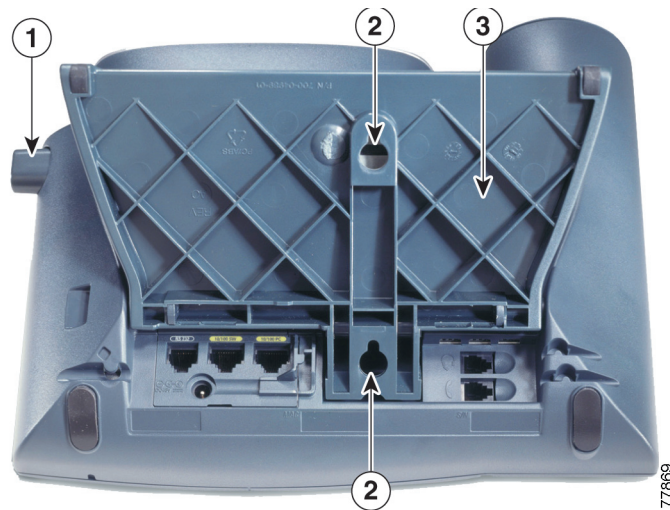
Caution

Use care not to damage wires or pipes located inside the wall when securing screws to wall studs.

Procedure

- Step 1** Push in the footstand adjustment button.
- Step 2** Adjust the footstand so it is flat against the back of the phone.
- Step 3** Insert two screws into a wall stud, matching them to the two screw holes on the back of the footstand. The keyholes fit standard phone jack mounts.
- Step 4** Hang the phone on the wall.

Figure 3-3 Parts Used in Wall Mounting the Cisco Unified IP Phone



1	Footstand adjustment button—Raises and lowers adjustment plate
2	Wall mounting screw holes
3	Adjustment plate—Raises and lowers phone vertically

Verifying the Phone Startup Process

After the Cisco Unified IP Phone has power connected to it, the phone begins its startup process by cycling through these steps.

1. These buttons flash on and off in sequence:
 - Headset. (Only if the handset is off-hook when the phone powers up. Hang up the handset within 3 seconds to have the phone launch its secondary load. To continue with the primary load, leave the handset off-hook.)
 - Mute.
 - Speaker.
2. Some or all of the line keys flash orange.

**Caution**

If the line keys flash red in sequence after flashing yellow, do not power down the phone until the sequence of red flashes completes. This sequence can take several minutes to complete.

3. Some or all of the line keys flash green.

Normally, this sequence takes just a few seconds. However, if the phone flash memory is erased or the phone load is corrupted, the sequence of green flashes will continue while the phone begins a software update procedure. If the phone performs this procedure, the following buttons light to indicate progress:

 - Headset—Phone is waiting for the network and completing CDP and DHCP configuration. (A DHCP server must be available in your network.)
 - Mute—Phone is downloading images from the TFTP server.
 - Speaker—Phone is writing images to its flash memory.
4. The phone screen displays the Cisco Systems, Inc., logo screen.
5. These messages display as the phone starts:
 - Verifying load (if the phone load does not match the load on the TFTP server). If this message displays, the phone start up again and repeats step 1 through step 4 above.
 - Configuring IP.
 - Updating CTL.
 - Updating Locale.
 - Configuring Unified CM List.
 - Registering.
6. The main phone screen displays:
 - Current date and time
 - Primary directory number
 - Additional directory numbers and speed dial numbers, if configured
 - Softkeys

If the phone successfully passes through these stages, it has started up properly. If the phone does not start up properly, see the [“Resolving Startup Problems”](#) section on page 9-1.

Configuring Startup Network Settings

If you are not using DHCP in your network, you must configure these network settings on the Cisco Unified IP Phone after installing the phone on the network:

- IP address
- IP subnet information
- Default gateway IP address
- TFTP server IP address

You may also configure these optional settings as necessary:

- Domain name
- DNS server IP address

Collect this information and see the instructions in [Chapter 4, “Configuring Settings on the Cisco Unified IP Phone.”](#)

Configuring Security on the Cisco Unified IP Phone

The security features protect against several threats, including threats to the identity of the phone and to data. These features establish and maintain authenticated communication streams between the phone and the Cisco Unified Communications Manager server, and digitally sign files before they are delivered.

For more information about the security features, see the [“Understanding Security Features for Cisco Unified IP Phones” section on page 1-9](#). Also, refer to *Cisco Unified Communications Manager Security Guide*.

A Locally Significant Certificate (LSC) installs on phones after you perform the necessary tasks that are associated with the Certificate Authority Proxy Function (CAPF). You can use Cisco Unified Communications Manager Administration to configure an LSC, as described in *Cisco Unified Communications Manager Security Guide*.

Alternatively, you can initiate the installation of an LSC from the Security Configuration menu on the phone. This menu also lets you update or remove an LSC.

Before you begin, make sure that the appropriate Cisco Unified Communications Manager and the CAPF security configurations are complete:

- The CTL file should have a CAPF certificate.
- The CAPF certificate must exist in the /usr/local/cm/.security/certs folder in every server in the cluster.
- The CAPF is running and configured.

Refer to *Cisco Unified Communications Manager Security Guide* for more information.

To configure an LSC on the phone, perform the following procedure. Depending on how you have configured the CAPF, this procedure installs an LSC, updates an existing LSC, or removes an existing LSC.

Procedure

-
- | | |
|---------------|--|
| Step 1 | Obtain the CAPF authentication code that was set when the CAPF was configured. |
| Step 2 | From the phone, press the Settings > Security Configuration . |

**Note**

You can control access to the Settings Menu by using the Settings Access field in the Cisco Unified Communications Manager Administration Phone Configuration window. For more information, see *Cisco Unified Communications Manager Administration Guide*.

- Step 3** Press ****#** to unlock settings on the Security Configuration menu. (See the [“Unlocking and Locking Options” section on page 4-3](#) for information using locking and unlocking options.)

**Note**

If a Settings Menu password has been provisioned, SIP phones present an “Enter password” prompt after you enter ****#**.

- Step 4** Scroll to LSC and press the **Update** softkey.

The phone prompts for an authentication string.

- Step 5** Enter the authentication code and press the **Submit** softkey.

The phone begins to install, update, or remove the LSC, depending on how the CAPF was configured. During the procedure, a series of messages appears in the LSC option field in the Security Configuration menu, so you can monitor progress. When the procedure completes successfully, the phone will display Installed or Not Installed.

The LSC install, update, or removal process can take a long time to complete. You can stop the process at any time by pressing the **Stop** softkey from the Security Configuration menu. (Settings must be unlocked before you can press this softkey.)

When the phone successfully completes the installation procedure, it displays “Success.” If the phone displays, “Failure,” the authorization string may be incorrect or the phone may not be enabled for upgrading. Refer to error messages generated by the CAPF and take appropriate actions.

You can verify that an LSC is installed on the phone by choosing **Settings > Model Information** and ensuring that the LSC setting shows Installed.

Related Topic

- [Understanding Security Features for Cisco Unified IP Phones, page 1-9](#)